

Interview Summary	Application No.	Applicant(s)	
	10/685,608	FORTUNA, RUDOLPH S.	
	Examiner	Art Unit	
	Mark T. Le	3617	

All participants (applicant, applicant's representative, PTO personnel):

- (1) Mark T. Le. (3) _____
 (2) John Harbst. (4) _____

Date of Interview: 11/18/04.

Type: a) ☐ Telephonic b) ☐ Video Conference
 c) ☒ Personal [copy given to: 1) ☐ applicant 2) ☒ applicant's representative]

Exhibit shown or demonstration conducted: d) ☐ Yes e) ☒ No.
 If Yes, brief description: _____.

Claim(s) discussed: 40-63.

Identification of prior art discussed: none.

Agreement with respect to the claims f) ☒ was reached. g) ☐ was not reached. h) ☐ N/A.


Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: See Continuation Sheet.

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE, OR THE MAILING DATE OF THIS INTERVIEW SUMMARY FORM, WHICHEVER IS LATER, TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

X See attachment

Examiner Note: You must sign this form unless it is an Attachment to a signed Office action.


 Examiner's signature, if required

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record

A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews

Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.

All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:

- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

- 1) A brief description of the nature of any exhibit shown or any demonstration conducted,
- 2) an identification of the claims discussed,
- 3) an identification of the specific prior art discussed,
- 4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
- 5) a brief identification of the general thrust of the principal arguments presented to the examiner,
(The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
- 6) a general indication of any other pertinent matters discussed, and
- 7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

Continuation of Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: Mr. Harbst indicated that claims 40-63 were added to broaden the previous proposed claims by removing the details of the lock assembly, but maintaining essentially the claimed frame structure of the previous proposed claims. In response, the examiner indicated that on a cursory review the claims as proposed appeared to be defined over the previously applied prior art; however, a final patentability determination will be made upon receiving the formal amendments .

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of: Rudolph S. Fortuna)

PATENT APPLICATION

Serial No.: 10/685,608)

Examiner: M. Le

Filed: October 15, 2003)

Group Art Unit: 3617

For: RAILROAD HOPPER CAR)
DISCHARGE GATE ASSEMBLY)

Confirmation No.: 5108

AMENDMENT "A"

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Sir:

Responding to a September 2, 2004 Office Action, kindly amend the above-identified
patent application as follows:

*Informal
Proposed*

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IN THE SPECIFICATION:

Please amend Paragraph [0016] as follows:

[0016] According to another aspect of the invention, there is provided a railroad hopper car discharge gate assembly including a frame having a pair of spaced, generally parallel side frame members and a pair of spaced, generally parallel end frame members fixed between the side frame members to define a ledgeless discharge outlet for the gate assembly. A gate is adapted for sliding endwise movements along a predetermined path of travel between closed and open positions relative to the discharge opening defined by the gate assembly frame. The gate includes upper and lower generally parallel surfaces. In an area surrounding peripheral edges of the gate, the side frame members and the end frame members each have a first leg portion or wall structure and a second apertured leg or flange portion extending in generally normal relation away from the first leg portion or wall structure. The spacing between the ~~first leg portions~~ wall structures of the side frame members and the end frame members being such that the ledgeless discharge outlet for the gate assembly measures about 1740 square inches. The gate assembly frame further includes laterally spaced support members disposed generally parallel to the side frame members and extending between the end frame members in sliding engagement with the lower surface of and for supporting the gate in the closed position against columnar load adapted to be exerted against the upper surface of the gate. The side frame members extend away from the discharge outlet for the gate assembly and are configured to support the gate when the gate is moved to the open position.

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Please amend Paragraph [0017] as follows:

[0017] According to this aspect of the invention, an operating shaft assembly, carried by the side frame members, is provided for rotational movement about a fixed axis. The operating shaft assembly is operably coupled to the gate. ~~Moreover~~ In one form, a lock assembly, operable in timed relation relative to rotation of ~~said~~ the operating shaft assembly, is provided for preventing inadvertent movement of ~~said~~ the gate toward the open position. Notably, the lock assembly is operably removed from the path of movement of the gate prior to the gate being positively moved, under the influence of the operating shaft assembly, toward the open position.

Please amend Paragraph [0018] as follows:

[0018] According to still another aspect of the invention, there is provided a gate assembly adapted to be secured in material receiving relation relative to a standard opening defined toward a bottom of a railroad hopper car. According to this aspect of the invention, the gate assembly includes a rigid frame having a longitudinal axis and including a series of side frame members and end frame members which are spaced relative to each other and configured to provide said frame with a ledgeless and generally ~~rectangular~~ square discharge opening sized substantially equivalent to the standard opening defined toward the bottom of the railroad hopper car whereby allowing commodity discharged from the standard opening at the bottom of the railcar to pass through the gate assembly in a substantially unhindered fashion thereby promoting the discharge of commodity from the railcar. Each side frame member and end frame member defines a series of apertures

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which combine to define a bolting pattern generally corresponding to a standard bolting pattern surrounding the standard opening toward the bottom of the railroad hopper car whereby facilitating securement of the gate assembly to the railroad hopper car. The ledgeless frame further includes a generally centralized support extending generally parallel to the longitudinal axis of the frame with two additional supports disposed to opposed sides of the centralized support. A gate is slidably mounted for endwise movements between open and closed positions relative to the ledgeless opening defined by the frame and along a generally linear path of movement for controlling discharge of commodity through the ledgeless opening. The gate is supported by the supports on the frame when in the closed position and supported by frame extensions when moved to the open position.

Please amend Paragraph [0019] as follows:

[0019] To move the gate between the open and closed positions, an operating shaft assembly is provided for rotation about a fixed axis. The operating shaft assembly has a pair of opposed ends disposed for operator access from opposite sides of the gate assembly frame. A drive mechanism operably couples the operating shaft assembly to the gate. A In accordance with this aspect, a lock assembly, operably connected to the operating shaft, is operable in timed relation relative to movement of the gate toward the open position. According to this aspect ~~of the invention~~, the lock assembly includes a stop mounted for movement between a first position, wherein the stop is disposed in the path of movement of said gate whereby inhibiting inadvertent movement of the

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gate from the closed position toward the open position, and a second position, wherein the stop is removed from the path of movement of the gate.

Please amend Paragraph [0022] as follows:

[0022] ~~To~~ According to this aspect, and to accomplish sequential operation of the operating shaft assembly, lock assembly and movement of the gate toward the open position, a lost motion mechanism is preferably provided between the operating shaft assembly and the gate. In one form, such lost motion mechanism collapses upon initial rotation of the operating shaft assembly in a direction to move the gate toward the open position whereafter the operating shaft assembly is operably coupled to the gate. In a preferred embodiment, the lost motion mechanism includes a slip socket defined by each of the laterally spaced pinions on the operating shaft assembly.

Please amend Paragraph [0024] as follows:

[0024] In a preferred form, each side frame member and end frame member of the gate assembly frame is provided with a first leg portion or wall structure and a second apertured leg or flange portion extending in general normal relation relative to each other. The end frame members and the side frame members of the gate assembly are preferably configured to add strength and rigidity to the gate assembly frame to withstand the increased loading placed thereon by the significantly increased size of the discharge opening in the gate assembly. That is, each end frame member and each side frame member of the gate assembly further includes a another

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flange or third leg portion joined to and disposed toward another end of the wall structure and extending in generally normal relation away from the wall structure or first leg portion, with the third leg or flange portion being spaced from but extending in the same direction as and in generally parallel, relation with the second leg or flange portion to minimize the section modulus of the gate assembly frame. In a most preferred form, the third leg or lower flange portion of the side frame and end frame members are arranged generally coplanar relative to each other. Moreover, the spacing between the second and third leg or flange portions of the side frame members is such that the cam structure provided on the operating shaft assembly traverses a path of rotation which is confined within the spacing provided therebetween.

Please add Paragraphs [0024.1 } through [0024.19] as follows:

[0024.1] In accordance with another aspect, there is provided a railroad hopper car discharge gate assembly including a rigid frame configured with a generally square and ledgeless discharge opening greater than 1600 square inches whereby allowing for rapid discharge of commodity therethrough. A gate having an upper surface defining an area generally equivalent to the size of the discharge opening is mounted on the frame for generally linear movements in a predetermined plane between a closed position, wherein the gate prevents flow of commodity through the discharge opening and, and an open position. The frame is configured to inhibit bending of the frame and the gate under columnar loading adapted to be applied to the greater than 1600 square inches of surface area defined by the gate and which is exposed to commodity.

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carried by a railcar to which the gate assembly is adapted to be operably coupled. The gate assembly frame includes an upper flange extending outwardly and about a periphery of the frame for facilitating connection of the gate assembly to a hopper of a railroad car. The frame further includes wall structure rigidly connected to and depending from the upper flange. The predetermined plane of movement of the gate is disposed in vertically spaced relation below the upper flange on the gate assembly frame.

[0024.2] Seal structure is arranged in sealing engagement with an upper surface and toward a peripheral edge of the gate when the gate is in the closed position. The seal structure is carried by the frame in vertically spaced relation below the upper flange. Preferably, the seal structure is configured to promote movement of the commodity therepast when the gate is moved toward the open position.

[0024.3] To selectively move the gate between closed and open positions, an operating shaft assembly is supported on the frame for rotation about a fixed axis. Preferably, the operating shaft assembly is operably coupled to the gate through pinions mounted on a shaft rotatable about the fixed axis. The pinions of the operating shaft assembly are arranged in intermeshing relation with racks carried by the gate. Moreover, a lock assembly is mounted on the gate assembly frame and includes a stop for inhibiting inadvertent movement of the gate from the closed position toward the open position. In one form, the lock assembly stop is urged into releasable engagement with the gate.

[0024.4] Preferably, the railroad hopper car discharge gate assembly further includes a

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plurality of laterally spaced support members. Such support members are carried by the frame and arranged in generally parallel relation relative to the direction in which the gate moves between the open and closed positions for limiting deflection of the gate.

[0024.5] According to yet another aspect, there is provided a railroad hopper car discharge gate assembly including a frame having a pair of spaced, generally parallel side frame members and a pair of spaced, generally parallel end frame members fixed between the side frame members to define a ledgeless discharge outlet for the gate assembly. A gate, having upper and lower generally parallel surfaces, is adapted for sliding movements along a predetermined path of travel between closed and open positions relative to the discharge opening defined by the gate assembly.

[0024.6] The side frame members and end frame members of the gate assembly frame each have wall structure with a first flange portion joined to and extending in generally normal relation away from an upper end of the wall structure. The spacing between the wall structures of the side frame members and end frame members is generally equal such that the ledgeless discharge outlet for the gate assembly has a generally square configuration and ranges in operative size between about 1400 and about 1760 square inches. Laterally spaced support members, carried by the frame, extend across the ledgeless discharge outlet. The support members extend generally parallel to the side frame members and between the end frame members and are arranged in sliding engagement with the lower surface of and support the gate in the closed position against columnar load adapted to be exerted against the upper surface of the gate. The predetermined path of travel of the gate is disposed in vertically spaced relation below the upper flange on the

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side frame and end frame members. Moreover, the side frame members, end frame members, and support members of the gate assembly are configured to withstand columnar loading adapted to be applied the upper surface of the gate, generally corresponding in cross-sectional size to the cross-sectional area of the generally square discharge opening. The side frame members extend away from the discharge outlet for the gate assembly and are configured to support the gate when the gate is moved to an open position.

[0024.7] Seal structure is arranged in sealing engagement with an upper surface and toward a peripheral edge of the gate when the gate is in the closed position. The seal structure is carried by the frame in vertically spaced relation below the flange on the side frame members and end frame members. The seal structure is configured to promote movement of the commodity therepast when the gate is moved toward the open position.

[0024.8] An operating shaft assembly is carried by the side frame members for rotational movement about a fixed axis. The operating shaft assembly is operably coupled to the gate through pinions mounted on an operating shaft rotatable about the fixed axis. In one form, the pinions intermesh with racks mounted on the lower surface of the gate. Preferably, the operating shaft extends transversely across the predetermined path of travel of the gate and includes capstans arranged at opposite ends thereof. The capstans are disposed for engagement from either side of the gate assembly.

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[0024.9] According to this aspect, a lock assembly is carried by the side frame members and includes a displaceable stop for inhibiting inadvertent movement of the gate from the closed position toward the open position. In one form, the lock assembly further includes a mechanical system carried by the side frame members for positively displacing the stop in timed relation relative to operation of the operating shaft assembly. In a preferred embodiment, a lost motion mechanism is operably disposed between the operating shaft assembly and the mechanical system for the lock assembly for effecting sequential movement of the stop and the gate in predetermined relation relative to each other. Moreover, the mechanical system preferably includes cam structure disposed adjacent to the side frame members to minimize the effect high torque requirements, inputted to the operating shaft assembly, have on operation of the lock assembly.

[0024.10] According to this aspect, each side frame member and each end frame member of the gate assembly frame further includes a second flange portion joined to and extending in generally normal relation away from a lower end of the wall structure. The second flange portion extends in the same direction as and in generally parallel relation with the first flange portion to add strength and rigidity to the frame. Preferably, a distance of about 9.0 inches is measurable between the first and second flange portions of each side frame member and each end frame member on the gate assembly frame. Moreover, the second flange portion on each of the side frame and end frame members are preferably arranged generally coplanar relative to each other.

[0024.11] Preferably, the support members of the gate assembly include a first support member extending generally along a longitudinal centerline of the gate assembly, with second and

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third support members disposed to opposite lateral sides of the longitudinal centerline of the gate assembly. In a preferred embodiment, each support member is configured to enhance the ability of the gate to slide thereover as the gate moves between the closed and open positions.

[0024.12] According to this aspect, a tamper seal arrangement is arranged in combination with the operating shaft assembly for accepting a seal. As will be appreciated, providing such a seal yields a visual indication whether the gate has been moved toward the open position.

[0024.13] According to still another aspect of the invention, there is provided a gate assembly adapted to be secured in material receiving relation relative to a standard opening defined toward a bottom of a railroad hopper car. The gate assembly includes a rigid frame having a longitudinal axis and including a series of rigidly interconnected side frame members and end frame members which are spaced relative to each other and configured to provide the frame with a ledgeless and generally square discharge opening sized substantially equivalent to the standard opening defined toward the bottom of the railroad hopper car so as to allow commodity, discharged from the opening in the bottom of the railcar, to pass through the gate assembly in a substantially unhindered fashion thereby promoting the discharge of commodity from the railcar. The side frame members and end frame members define a bolting pattern generally corresponding to a standard bolting pattern surrounding the standard opening toward the bottom of the railroad hopper car whereby facilitating securement of the gate assembly to the railroad hopper car. Each side frame member and each end frame member include a peripheral flange portion joined to and extending outward from an upper end of depending wall structure. A generally centralized

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support, carried by the frame, extends generally parallel to the longitudinal axis of the frame with two additional supports disposed to opposed sides of the centralized support.

[0024.14] A gate is slidably mounted on the frame for endwise movements between open and closed positions relative to the ledgeless opening defined by the frame. The gate slides along a generally linear path of movement for controlling discharge of commodity through the ledgeless opening. The gate is supported by the supports when in the closed position and is supported by the frame when moved to the open position. Preferably, each support on the frame is provided with material for enhancing the ability of the gate to slide thereover as the gate moves between the closed and open positions. The linear path of movement of the gate is disposed vertically beneath the flange portion on each side frame member and each end frame member of the rigid gate assembly frame.

[0024.15] Seal structure is arranged in sealing engagement with an upper surface and toward a peripheral edge of the gate when the gate is in the closed position. The seal structure is carried by the frame in vertically spaced relation below the flange on the side frame members and end frame members. The seal structure is configured to promote movement of the commodity discharged from the hopper car therepast when the gate is moved toward the open position.

[0024.16] An operating shaft assembly is mounted on frame extensions of the side frame members for rotation about a fixed axis. The operating shaft assembly defines a pair of opposed ends disposed for operator access from opposite sides of the gate assembly frame. Preferably, the operating shaft assembly includes an elongated shaft supported for rotation by a pair of operating

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handles secured at opposite ends of the shaft and rotatably mounted on the frame extensions of the gate assembly.

[0024.17] Preferably, the gate assembly frame further includes structure for limiting deflection of the shaft of the operating shaft assembly when the operating shaft assembly is rotated to move the gate from the closed toward the open position. Moreover, each side frame member and each end frame member furthermore preferably includes another peripheral flange portion joined to and extending outwardly from a lower end of the depending wall structure such that each end frame member and each side frame member is configured to maximize the section modulus of the frame. In one form, the flange portion extending outwardly from the upper end of the wall structure of each end frame member and each side frame member defines a series of apertures defining the bolting pattern for the gate assembly. In a preferred form, the flange portions extending outwardly from the lower end of the wall structure on the side frame and end frame members of the gate assembly frame are arranged generally coplanar relative to each other.

[0024.18] According to this aspect, a drive mechanism operably couples the operating shaft assembly to the gate. Preferably, the drive mechanism includes a pair of laterally spaced pinions mounted on a shaft of the operating shaft assembly. The pinions are arranged in intermeshing relation with racks carried by the gate. As such, and upon rotation of the operating shaft assembly, the gate linearly moves between the open and closed positions, depending upon the rotational direction the operating shaft assembly is turned. Moreover, a lock assembly is mounted on the frame extensions and includes a stop mounted for movement between a first position,

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wherein the stop is disposed in the path of movement of the gate whereby inhibiting inadvertent movement of the gate from the closed position toward the open position, and a second position, wherein the stop permits movement of the gate toward the open position

[0024.19] According to this aspect, a tamper seal arrangement is arranged in combination with the operating shaft assembly for accepting a seal. As will be appreciated, providing such a seal yields a visual indication whether the gate has been moved toward the open position.

Please amend Paragraph [0049] as follows:

[0049] Turning to FIGS. 3 and 4, each gate assembly 30 includes a rigid frame 32 having a longitudinal axis 33. The gate assembly frame 32 is formed of a pair of generally parallel side frame members 34, 35 and a pair of generally parallel end frame members 36, 37 fixed between the side frame members 34, 35. The side frame members 34, 35 and end frame members 36, 37, in combination, define a generally ~~rectangular~~ square and ledgeless discharge opening 40 therebetween.

Please amend Paragraph [0051] as follows:

[0051] As shown in FIG. 2, side frame member 34 includes a first, generally planar leg portion or wall structure 42 and a second leg portion 44 disposed toward one end of and extending in generally normal relation relative to and away from the wall structure or first leg portion 42. The second leg or flange portion 44 defines a series of side-by-side openings or holes

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46. To add further rigidity and stiffness thereto, the side frame member 34 further includes a third leg or flange portion 48 disposed toward an opposite end of and extending in generally normal relation and away from the wall structure or first leg portion 42. As shown, the third leg or flange portion 48 is spaced from but extends in the same direction and in generally parallel relation with the second leg or flange portion 44. Preferably, the first, second and third leg portions 42, 44 and 48, respectively, are integrally formed with each other. In a preferred form, the first and third leg or flange portions of side frame member 34 are spaced apart by a distance of about 9.0 inches.

Please amend Paragraph [0052] as follows:

[0052] As shown in FIG. 5, end frame member 36 includes a first, generally planar leg portion or wall structure 52 and a second leg or flange portion 54 disposed toward one end of and extending in generally normal relation relative to and away from the wall structure or first leg portion 52. As shown, the second leg or flange portion 54 defines a series of side-by-side openings or holes 56. Suffice it to say, the holes or openings 46 in the side frame members 34, 35 combine with the holes or openings 56 in the end frame members 36, 37 to define a standard bolting pattern which corresponds to the standard bolting pattern on the mounting flange 20 of the hopper 12. In the illustrated embodiment, suitable fasteners 59 pass through the openings 22 in the hopper mounting flange 20 and through the openings 46, 56 in the gate assembly frame 32 to secure the gate assembly 30 to hopper 12.

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Please amend Paragraph [0053] as follows:

[0053] To add further rigidity and stiffness thereto, the end frame member 36 further includes a third leg or flange portion 58 disposed toward an opposite end of and extending in generally normal relation away from the wall structure or first leg portion 52. As shown, the third leg or flange portion 58 is spaced from but extends in the same direction and in generally parallel relation with the second leg or flange portion 54. Preferably, the first, second and third leg portions 52, 54 and 58 of the end frame member 36 are integrally formed with each other. In the preferred embodiment, the third leg or flange portion 48 of the side frame members 34, 35 are arranged in generally coplanar relationship with the third leg or flange portion 58 of the end frame members 36, 37 whereby facilitating attachment of a conventional unloading boot or the like to the gate assembly 30.

Please amend Paragraph [0054] as follows:

[0054] According to the present invention, the lateral spacing disposed between an inner surface of the generally planar wall structures or first leg portions 42 of the side frame members 34 and 35 preferably ranges between about 37.5 inches to about 44 inches. In a most preferred embodiment, the lateral spacing disposed between an inner surface of the generally planar wall structures or first leg portions 42 of the side frame members 34 and 36 measures about 43.5 inches. The longitudinal spacing disposed between an inner surface of the generally planar wall structures or first leg portions 52 of the end frame members 35 and 37 preferably ranges between

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about 37.5 inches to about 46 inches. In a most preferred embodiment, the longitudinal spacing disposed between an inner surface of the generally planar wall structures or first leg portions 52 of the end frame members 36 and 37 measures about 45.5 inches so as to provide the discharge opening 40 with a generally square configuration.

Please amend Paragraph [0055] as follows:

[0055] A gate 60 of a size generally corresponding to that of the ledgeless discharge opening 40 is mounted for sliding movements between closed and open positions along a linear predetermined path of movement for controlling the discharge of commodity from hopper 12 (FIG. 1). As shown in FIGS. 2 and 3, the predetermined path of movement or travel of gate 60 is disposed in vertically spaced relation below the upper flange portions 44 and 54 on the side frame members 34, 35 and end frame members 36, 37, respectively, of the gate assembly frame structure 32. As shown in FIG. 6, gate 60 has a planar configuration and includes a first or upper surface 62 and a second or lower surface 64 extending generally parallel relative to each other.

Please amend Paragraph [0059] as follows:

[0059] As shown in FIGS. 2 and 5, seal structure 90 is preferably carried on the gate assembly frame 32 for inhibiting debris and insect infiltration between the frame 32 and the gate 60. In the illustrated embodiment, seal structure 90 is arranged relative to in sealing engagement with the upper surface 62 and toward a periphery of the gate 60 when gate 60 is in the closed

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position. In the exemplary embodiment, and as shown in FIGS. 2 and 3, seal structure 90 includes a hollow mounting 92 secured to the side frame members and end frame members 34, 35 and 36, 37, respectively, of the gate assembly frame 32 in vertically spaced relation below the upper flange portions 44 and 54 of the side-frame members and end frame members 34, 35 and 36, 37, respectively. The hollow mounting 92 is specifically configured to allow commodity discharged from the hopper 12 of railcar 10 to readily pass thereover. Moreover, structure 90 includes a conventional carpet seal 94, or other suitable seal, accommodated preferably within the mounting 92, and configured to sealingly engage about the periphery of the upper surface 62 of and after gate 60 moved to a closed position.

Please amend Paragraph [0064] as follows:

[0064] Movement of the gate 60 from a closed position toward an open position along its fixed path of movement is influenced by a lock assembly 120. The purpose of the lock assembly 120 is to releasably hold the gate 60 against movement toward an open position until the lock assembly 120 is purposefully released by the operator. ~~With the present~~ one form of the invention, and in compliance with AAR Standards, lock assembly 120 is configured such that it is initially released in response to operation of the operating shaft assembly automatically followed by movement of the gate 60 toward an open position. That is, the unlatching of the lock assembly 120 and opening of the gate 60 are affected in sequential order relative to each other and in response to rotation of the operating shaft assembly 100.

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Please amend Paragraph [0065] as follows:

[0065] ~~Turning to~~ In the exemplary embodiment illustrated in FIG. 7, lock assembly 120 is preferably designed as a subassembly which is fabricated independent of the frame 32 and subsequently added thereto. As shown, lock assembly 120 includes a stop 122 mounted for movement between a first position, wherein stop 122 is disposed in the path of movement of the gate 60 to inhibit inadvertent movement of the gate 60 from the closed position toward the open position, and a second position, wherein stop 122 is removed from the path of movement of the gate 60. Lock assembly 120 ~~further~~ furthermore preferably includes a mechanical system 124 for moving the stop 122 between the first and second positions in timed sequential movement relative to movement of the gate 60 toward the open position

Please amend Paragraph [0078] as follows:

[0078] ~~As will be appreciated~~ According to one aspect, timed unlatching or removal of the lock assembly stop 122 from the path of movement of the gate 60 is critical to proper performance of gate assembly 30. Of course, and since the AAR Standards require unlatching of the gate 60 to relate to operation shaft assembly 100, inadvertent skipping movements of the pinions 116 relative to the racks 114 ~~will~~ can destroy such timed relationship. It is not unusual, however, for the pinions 116 to skip relative to the racks 114, thus, hindering timing of operation between the gate 60 and lock mechanism 120 when an unusual high level of torque is inputted to the shaft assembly 100. Such high levels of torque typically result during the initial openings stages for gate 60.

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Such high levels of torque tend to cause the shaft 104 of assembly 100 to deflect relative to its rotational axis 102 thereby resulting in displacement of the pinions 116 relative to the racks 114, thus, destroying timed movement of the gate 60 with operation of the operating shaft assembly 100.

Please amend Paragraph [0081] as follows:

[0081] ~~Operation~~ In one form, operation of the gate 60 and lock assembly 120 is such that when gate 60 is in a closed position, each stop 122, 122' of assembly 120 (FIG. 7) is in positive engagement with gate 60 and shaft 104 of assembly 100 is disposed relative to the slip pinions 116 substantially as shown in FIG. 12. The gate 60 is locked in its closed position at this time. With the gate 60 closed, as shown in FIG. 12, the outer surface of shaft 104 extends generally parallel to and likely engages the walls or surfaces 172 of each slip socket or recess 166 of each slip pinion 116.

Please amend Paragraph [0092] as follows:

[0092] The gate assembly 30 is furthermore configured with a frame 32 capable of withstanding significantly increased net columnar loading, as compared to conventional gate assemblies, coupled with advantageously offering a reduced cumulative distance between an upper surface of the second leg portion 44 on the gate assembly frame 32 and the lowermost surface on the third leg portion 46 of the gate assembly frame 32 compared to conventional gate-

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assemblies. Accordingly, and after securing it to the hopper car 10, the gate assembly 30 of the present invention offers increased clearance beneath a lowermost surface thereof. Offering such an advantage has been recognized through the elimination of the transition wall section normally associated with railroad hopper-type gate assemblies and a unique gate assembly design offering a discharge opening 40 generally corresponding to the standard opening 18 on the hopper car 10. Although configured to withstand the significantly increased net columnar loading, as compared to conventional gate assemblies, the frame members 34, 35 and 36, 37 of the gate assembly frame 32 are advantageously designed such that the path traversed by the peripheral edge of the cam structure 42 is embraced within limits defined by the second and third leg or flange portions 44, 48 and 54, 58 thereof whereby promoting attachment of a conventional discharge boot to the underside of the gate assembly frame 32. In a preferred form, the leg or flange portions 44, 48 and 54, 58 of frame members 34, 35 and 36, 37, respectively, are separated by a distance of about 9.0 inches.

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IN THE CLAIMS:

1. (Currently Amended) A railroad hopper car discharge gate assembly, comprising:

a rigid frame configured with a generally ~~rectangular~~ square and ledgeless discharge opening greater than 1600 square inches whereby allowing for rapid discharge of commodity therethrough, with a gate having a an upper surface defining an area generally equivalent to the size of the discharge opening and being mounted on said frame for generally linear movements in a predetermined plane between a closed position, wherein said gate prevents flow of commodity through said discharge opening and, and an open position, and wherein said frame is ~~further~~ configured to inhibit bending of said frame and said ~~door~~ gate under columnar loading adapted to be applied to the greater than 1600 square inches of surface area defined by said gate and which is exposed to commodity carried by a railcar to which said gate assembly is adapted to be operably coupled, with said frame including an upper flange extending outwardly and about a periphery of said frame for facilitating connection of said gate assembly to a hopper of a railroad car, said frame further including wall structure rigidly connected to and depending from said upper flange, and wherein said predetermined plane of movement of said gate is disposed in vertically spaced relation below said upper flange;

seal structure arranged in sealing engagement with the upper surface and toward a periphery of said gate when the gate is in the closed position, with said seal structure being carried by said frame in vertically spaced relation below said upper flange and configured to promote movement of said commodity therepast when said gate is moved toward said open position;

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an operating shaft assembly supported by opposed frame extensions for rotation about a fixed axis, with said operating shaft assembly being operably coupled to said gate; and

a lock assembly operable in timed relation relative to rotation of said operating shaft assembly, said lock assembly including a stop which, when said gate is in the closed position, positively engages with the gate thereby preventing inadvertent movement of said gate toward the open position and which is operably removed from the path of movement of the gate prior to said gate being positively moved under the influence of said operating shaft assembly moved toward the open position.

2. (Canceled)

3. (Currently Amended) The railroad hopper car discharge gate assembly according to Claim 1 wherein said frame further includes a plurality of laterally spaced support members arranged in generally parallel relation relative to the direction in which said gate moves between the open and closed positions for limiting deflection of said gate and increasing stiffness of said frame.

4. (Original) The railroad hopper car discharge gate assembly according to Claim 3 wherein each of said support members is provided with material for enhancing the ability of the gate to slide thereover as said gate moves between the closed and open positions.

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5. (Original) The railroad hopper car discharge gate assembly according to Claim 1 wherein said operating shaft assembly is operably coupled to said gate through pinions mounted on a shaft rotatable about said fixed axis, with said pinions being arranged in intermeshing relation with racks carried by said gate.
6. (Original) The railroad hopper car discharge gate assembly according to Claim 5 wherein said frame further includes structure for limiting deflection of the shaft of said operating shaft assembly relative to said fixed axis when said shaft is rotated to move said gate toward the open position.
7. (Original) The railroad hopper car discharge gate assembly according to Claim 1 wherein the stop of said lock assembly is urged into releasable engagement with said gate.
8. (Original) The railroad hopper car discharge gate assembly according to Claim 1 wherein a mechanical system is provided between the stop of said lock assembly and said operating shaft assembly for positively displacing said stop from engagement with said gate upon rotation of said operating shaft assembly and prior to movement of said gate toward the open position.
9. (Original) The railroad hopper car discharge gate assembly according to Claim 8

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further including a lost motion mechanism which collapses upon rotation of the operating shaft assembly in a direction to move the gate toward the open position whereafter said operating shaft assembly is operably coupled to said gate.

10. (Currently Amended) A railroad hopper car discharge gate assembly, comprising:

a frame including a pair of spaced, generally parallel side frame members and a pair of spaced, generally parallel end frame members fixed between said side frame members to define a ledgeless discharge outlet for said gate assembly;

a gate adapted for sliding endwise movements along a predetermined path of travel between closed and open positions, with said gate including upper and lower generally parallel surfaces;

and wherein, in an area surrounding peripheral edges of said gate, said side frame members and said end frame members each ~~have a first leg portion~~ having wall structure and a ~~second apertured leg~~ first flange portion joined to and extending in generally normal relation away from said ~~first leg portion~~ an upper end of said wall structure, with the spacing between the ~~first leg portions~~ wall structures of said side frame members and said end frame members being generally equal such that the ledgeless discharge outlet for said gate assembly has a generally square configuration and ranges in size between about 1400 and about 1760 square inches, with said frame further including laterally spaced support members disposed generally parallel to said side frame members and between said end frame members in sliding engagement with the lower

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surface of and for supporting the gate in the closed position against columnar load adapted to be exerted against the upper surface of said gate, with the predetermined path of travel of said gate being disposed in vertically spaced relation below the upper flange on said side frame members and said end frame members, and wherein said side frame members, said end frame members, and said support members are configured to withstand columnar loading adapted to be applied the upper surface of said gate, corresponding in cross-sectional size to the cross-sectional area of said generally square discharge opening, and wherein said side frame members extend away from the discharge outlet for said gate assembly and are configured to support said gate when said gate is moved to an open position;

seal structure arranged in sealing engagement with the upper surface and toward a periphery of said gate when the gate is in the closed position, with said seal structure being carried by said frame in vertically spaced relation below the flange on said side frame members and said end frame members and configured to promote movement of said commodity therepast when said gate is moved toward said open position;

an operating shaft assembly carried by said side frame members for rotational movement about a fixed axis, said operating shaft assembly being operably coupled to said gate; and

a lock assembly including a displaceable stop operable in timed relation relative to rotation of said operating shaft assembly for preventing inadvertent movement of said gate toward the open position and which is operably removed from the path of movement of the gate prior to said gate being positively moved under the influence of said operating shaft assembly moved toward

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the open position.

11. Canceled.

12. (Original) The railroad hopper car discharge gate assembly according to Claim 10 wherein said support members include a first support member extending generally along a longitudinal centerline of said gate assembly along with second and third support members disposed to opposite lateral sides of the longitudinal centerline of said gate assembly.

13. (Original) The railroad hopper car discharge gate assembly according to Claim 12 wherein each support member is provided with material for enhancing the ability of the gate to slide thereover as said gate moves between the closed and open positions.

14. (Original) The railroad hopper car discharge gate assembly according to Claim 10 wherein said operating shaft assembly is operably coupled to said gate through pinions mounted on a shaft rotatable about said fixed axis, with said pinions being arranged in intermeshing relation with racks mounted on the lower surface of said gate.

15. (Original) The railroad hopper car discharge gate assembly according to Claim 14 wherein said operating shaft extends transversely across the predetermined path of travel of said

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gate and includes capstans arranged at opposite ends thereof, said capstans being disposed for engagement from either side of said gate assembly.

16. (Original) The railroad hopper car discharge gate assembly according to Claim 15 wherein said frame further includes structure arranged along the length of said operating shaft for minimizing the effect high torque requirements inputted to said operating shaft assembly have on operation of said gate assembly.

17. (Original) The railroad hopper car discharge gate assembly according to Claim 10 wherein said lock assembly further includes a mechanical system carried by said side frame members for positively displacing said stop in timed relation relative to operation of said operating shaft assembly.

18. (Original) The railroad hopper car discharge gate assembly according to Claim 17 wherein said mechanical system includes cam structure disposed adjacent to the side frame members to minimize the effect high torque requirements inputted to said operating shaft assembly have on operation of said lock assembly.

19. (Currently Amended) The railroad hopper car discharge gate assembly according to Claim 18 wherein each side frame member and said end frame member further includes a ~~third leg~~

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second flange portion joined to and extending in generally normal relation away from ~~said first leg portion~~ a lower end of said wall structure, with said ~~third leg~~ second flange portion being spaced from but extending in the same direction as and in generally parallel relation with said ~~second leg~~ first flange portion to add strength and rigidity to said frame.

20. (Currently Amended) The railroad hopper car discharge gate assembly according to Claim 19 wherein a peripheral edge of said cam structure on said operating shaft assembly traverses a path of rotation confined within the spacing provided between said first and second ~~and third leg~~ flange portions of each side frame member.

21. (Currently Amended) The railroad hopper car discharge gate assembly according to Claim 19 wherein a distance of about 9.0 inches is measurable between the said first and second ~~and third leg~~ flange portions of each side frame member and each end frame member.

22. (Currently Amended) The railroad hopper car discharge gate assembly according to Claim 19 wherein the ~~third leg~~ second flange portion on each of the side frame and end frame members of said frame are arranged generally coplanar relative to each other.

23. (Original) The railroad hopper car discharge gate assembly according to Claim 17 further including a lost motion mechanism operably disposed between said operating shaft

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assembly and the mechanical system for said lock assembly for effecting sequential movement of the stop and said gate in predetermined relation relative to each other.

24. (Original) The railroad hopper car discharge gate assembly according to Claim 23 wherein said stop is mounted on and movable with a rockshaft extending parallel to and above said gate, said rockshaft having at least one follower toward one end thereof for engaging a periphery of a cam arranged toward a corresponding end of said operating shaft assembly thereby positively moving said stop regardless of the torque input to said operating shaft assembly.

25. (Original) The railroad hopper car discharge gate assembly according to Claim 10 wherein a tamper seal arrangement is arranged in combination with said operating shaft assembly for accepting a seal for visually indicating whether said gate has been moved toward the open position.

26. (Currently Amended) A gate assembly adapted to be secured in material receiving relation relative to a standard opening defined toward a bottom of a railroad hopper car, said gate assembly comprising:

a rigid frame having a longitudinal axis and including a series of rigidly interconnected side frame members and end frame members which are spaced relative to each other and configured to provide said frame with a ledgeless and generally ~~rectangular~~ square discharge opening sized

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substantially equivalent to the standard opening defined toward the bottom of the railroad hopper car whereby allowing commodity discharged from the opening in the bottom of the railcar to pass through said gate assembly in a substantially unhindered fashion thereby promoting the discharge of commodity from the railcar, with said side frame members and said end frame members defining a bolting pattern generally corresponding to a standard bolting pattern surrounding the standard opening toward the bottom of the railroad hopper car whereby facilitating securement of the gate assembly to the railroad hopper car, with each side frame member and end frame member including a peripheral flange portion joined to and extending outward from an upper end of depending wall structure, and wherein said ledgeless frame further includes a generally centralized support extending generally parallel to the longitudinal axis of said frame with two additional supports disposed to opposed sides of said centralized support;

a gate slidably mounted on said frame for endwise movements between open and closed positions relative to said ledgeless opening defined by said frame and along a generally linear path of movement for controlling discharge of commodity through said ledgeless opening, with said gate being supported by said supports when in the closed position and supported by said frame when moved to the open position, and wherein the linear path of movement of said gate is disposed vertically beneath the flange portion on each side frame member and end frame member of said rigid frame;

seal structure arranged in sealing engagement with the upper surface and toward a periphery of said gate when said gate is in the closed position, with said seal structure being

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carried by said frame in vertically spaced relation below the flange on said side frame members and said end frame members and configured to promote movement of said commodity therepast when said gate is moved toward said open position;

an operating shaft assembly mounted on frame extension of said side frame members for rotation about a fixed axis, said operating shaft assembly defining a pair of opposed ends disposed for operator access from opposite sides of said frame;

a drive mechanism for operably coupling said operating shaft assembly to the gate whereby rotation of said operating shaft assembly linearly moves said gate between the open and closed positions, with said drive mechanism including a lost motion mechanism operably disposed between said operating shaft assembly and said gate for allowing a predetermined range of free rotation of said operating shaft assembly prior to movement of said gate toward the open position; and

a lock assembly operably connected to said operating shaft and operable in timed relation relative to movement of said gate toward the open position, said lock assembly including a stop mounted for movement between a first position, wherein said stop is disposed in the path of movement of said gate whereby inhibiting inadvertent movement of the gate from the closed position toward the open position, and a second position, wherein said stop is removed from the path of movement of the gate, with said stop being movable from said first position to said second position during the collapse of the lost motion mechanism of said drive mechanism.

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27. (Original) The gate assembly according to Claim 26 wherein each support on said frame is provided with material for enhancing the ability of the gate to slide thereover as said gate moves between the closed and open positions.

28. Canceled.

29. (Original) The gate assembly according to Claim 26 wherein said drive mechanism includes a pair of laterally spaced pinions mounted on a shaft of said operating shaft assembly, with said pinions being arranged in intermeshing relation with racks carried by said gate.

30. (Original) The gate assembly according to Claim 29 wherein said lost motion mechanism of said drive mechanism comprises a slip socket defined by each of said laterally spaced pinions.

31. (Original) The gate assembly according to Claim 26 wherein said frame further includes structure for limiting deflection of said shaft of said shaft assembly relative to said fixed axis when said operating shaft assembly is rotated to move said gate from the closed to the open position.

32. (Currently Amended) The gate assembly according to Claim 26 wherein said lock

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assembly further includes a mechanical system carried by said side frame members for positively displacing said stop in timed relation relative to movement of said gate toward the open position.

33. (Original) The gate assembly according to Claim 32 wherein said mechanical system includes structure disposed adjacent to the side frame members to minimize the effect high torque requirements of said operating shaft assembly have on operation of said mechanical system.

34. (Original) The gate assembly according to Claim 33 wherein said operating shaft assembly includes an elongated shaft supported for rotation about said fixed axis by a pair of operating handles secured at opposite ends of said shaft and rotatably mounted on the frame of said gate assembly.

35. (Original) The gate assembly according to Claim 34 wherein at least one of said operating handles includes a cam arranged for rotation therewith, and wherein the mechanical system of said lock assembly further includes a rockshaft supported by frame extensions, with said rockshaft having said stop mounted thereon for rotation therewith, and wherein said mechanical system further includes a follower secured to said rockshaft and arranged in operable engagement with the cam on said at least one of said operating handles whereby said stop is moved between positions in response to rotation of the operating shaft assembly.

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36. (Currently Amended) The gate assembly according to Claim 35 wherein each side frame member and ~~said~~ each end frame member further includes ~~a first leg~~ another peripheral flange portion ~~with second and third leg portions joined to and~~ extending generally normal thereto and ~~toward opposite ends thereof~~ outwardly from a lower end of said depending wall structure such that each end frame member and each side frame member is configured to maximize the section modulus of said frame, and wherein the ~~second leg~~ flange portion extending outwardly from the upper end of said wall structure of each end frame member and each side frame member defines a series of apertures defining the bolting pattern for said gate assembly.

37. (Original) The gate assembly according to Claim 36 wherein a peripheral edge of said cam of said mechanical system traverses a path of rotation confined within the spacing provided between said ~~second and third leg~~ flange portions of each side frame member.

38. (Original) The gate assembly according to Claim 36 wherein the ~~third leg~~ flange portions extending outwardly from the lower end of the wall structure ~~of~~ on the side frame members and end frame members of said frame are arranged generally coplanar relative to each other.

39. (Original) The gate assembly according to Claim 26 wherein a tamper seal arrangement is provided in combination with said operating shaft assembly for accepting a seal for

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visually indicating whether said gate has been moved toward the open position.

Please add new Claims 40 through 63 as follows:

40. (New) A railroad hopper car discharge gate assembly, comprising:

a rigid frame configured with a generally square and ledgeless discharge opening greater than 1600 square inches whereby allowing for rapid discharge of commodity therethrough, with a gate having an upper surface defining an area generally equivalent to the size of the discharge opening and being mounted on said frame for generally linear movements in a predetermined plane between a closed position, wherein said gate prevents flow of commodity through said discharge opening and, and an open position, and wherein said frame is configured to inhibit bending of said frame and said gate under columnar loading adapted to be applied to the greater than 1600 square inches of surface area defined by said gate and which is exposed to commodity carried by a railcar to which said gate assembly is adapted to be operably coupled, with said frame including an upper flange extending outwardly and about a periphery of said frame for facilitating connection of said gate assembly to a hopper of a railroad car, said frame further including wall structure rigidly connected to and depending from said upper flange, and wherein said predetermined plane of movement of said gate is disposed in vertically spaced relation below said upper flange;

seal structure arranged in sealing engagement with the upper surface and toward a periphery of said gate when the gate is in the closed position, with said seal structure being carried

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by said frame in vertically spaced relation below said upper flange and configured to promote movement of said commodity therepast when said gate is moved toward said open position;

an operating shaft assembly supported on said frame for rotation about a fixed axis, with said operating shaft assembly being operably coupled to said gate; and

a lock for inhibiting inadvertent movement of said gate from the closed position toward the open position.

41. (New) The railroad hopper car discharge gate assembly according to Claim 40 further including a plurality of laterally spaced support members carried by said frame and arranged in generally parallel relation relative to the direction in which said gate moves between the open and closed positions for limiting deflection of said gate.

42. (New) The railroad hopper car discharge gate assembly according to Claim 40 wherein said operating shaft assembly is operably coupled to said gate through pinions mounted on a shaft rotatable about said fixed axis, with said pinions being arranged in intermeshing relation with racks carried by said gate.

43. (New) The railroad hopper car discharge gate assembly according to Claim 40 wherein the stop of said lock assembly is urged into releasable engagement with said gate.

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44. (New) A railroad hopper car discharge gate assembly, comprising:

a frame including a pair of spaced, generally parallel side frame members and a pair of spaced, generally parallel end frame members fixed between said side frame members to define a ledgeless discharge outlet for said gate assembly;

a gate adapted for sliding endwise movements along a predetermined path of travel between closed and open positions, with said gate including upper and lower generally parallel surfaces;

and wherein said side frame members and said end frame members each have wall structure with a first flange portion joined to and extending in generally normal relation away from an upper end of said wall structure, with the spacing between the wall structures of said side frame members and said end frame members being generally equal such that the ledgeless discharge outlet for said gate assembly has a generally square configuration and ranges in operative size between about 1400 and about 1870 square inches, with laterally spaced support members carried by said frame and extending across said discharge outlet such that said support members extend generally parallel to said side frame members and between said end frame members in sliding engagement with the lower surface of and for supporting the gate in the closed position against columnar load adapted to be exerted against the upper surface of said gate, with the predetermined path of travel of said gate being disposed in vertically spaced relation below the upper flange on said side frame members and said end frame members, and wherein said side frame members, said end frame members, and said support members are configured to withstand

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columnar loading adapted to be applied the upper surface of said gate, generally corresponding in cross-sectional size to the cross-sectional area of said generally square discharge opening, and wherein said side frame members extend away from the discharge outlet for said gate assembly and are configured to support said gate when said gate is moved to an open position;

seal structure arranged in sealing engagement with the upper surface and toward a periphery of said gate when the gate is in the closed position, with said seal structure being carried by said frame in vertically spaced relation below the flange on said side frame members and said end frame members and configured to promote movement of said commodity therepast when said gate is moved toward said open position;

an operating shaft assembly carried by said side frame members for rotational movement about a fixed axis, said operating shaft assembly being operably coupled to said gate; and

a lock for inhibiting inadvertent movement of said gate from the closed position toward the open position.

45. (New) The railroad hopper car discharge gate assembly according to Claim 44 wherein said support members include a first support member extending generally along a longitudinal centerline of said gate assembly, with second and third support members disposed to opposite lateral sides of the longitudinal centerline of said gate assembly.

46. (New) The railroad hopper car discharge gate assembly according to Claim 45 wherein

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each support member is configured to enhance the ability of the gate to slide thereover as said gate moves between the closed and open positions.

47. (New) The railroad hopper car discharge gate assembly according to Claim 45 wherein said operating shaft assembly is operably coupled to said gate through pinions mounted on a shaft rotatable about said fixed axis, with said pinions being arranged in intermeshing relation with racks mounted on the lower surface of said gate.

48. (New) The railroad hopper car discharge gate assembly according to Claim 47 wherein said operating shaft extends transversely across the predetermined path of travel of said gate and includes capstans arranged at opposite ends thereof, said capstans being disposed for engagement from either side of said gate assembly.

49. (New) The railroad hopper car discharge gate assembly according to Claim 44 wherein said lock assembly further includes a mechanical system carried by said side frame members for positively displacing said stop in timed relation relative to operation of said operating shaft assembly.

50. (New) The railroad hopper car discharge gate assembly according to Claim 49 further including a lost motion mechanism operably disposed between said operating shaft assembly and

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the mechanical system for said lock assembly for effecting sequential movement of the stop and said gate in predetermined relation relative to each other.

51. (New) The railroad hopper car discharge gate assembly according to Claim 49 wherein said mechanical system includes cam structure disposed adjacent to the side frame members to minimize the effect high torque requirements inputted to said operating shaft assembly have on operation of said lock assembly.

52. (New) The railroad hopper car discharge gate assembly according to Claim 44 wherein each side frame member and each end frame member of said frame further includes a second flange portion joined to and extending in generally normal relation away from a lower end of said wall structure, with said second flange portion extending in the same direction as and in generally parallel relation with said first flange portion to add strength and rigidity to said frame.

53. (New) The railroad hopper car discharge gate assembly according to Claim 52 wherein a distance of about 9.0 inches is measurable between the said first and second flange portions of each side frame member and each end frame member.

54. (New) The railroad hopper car discharge gate assembly according to Claim 52 wherein the second flange portion on each of the side frame and end frame members of said frame are

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arranged generally coplanar relative to each other.

55. (New) The railroad hopper car discharge gate assembly according to Claim 44 wherein a tamper seal arrangement is arranged in combination with said operating shaft assembly for accepting a seal for visually indicating whether said gate has been moved toward the open position.

56. (New) A gate assembly adapted to be secured in material receiving relation relative to a standard opening defined toward a bottom of a railroad hopper car, said gate assembly comprising:

a rigid frame having a longitudinal axis and including a series of rigidly interconnected side frame members and end frame members which are spaced relative to each other and configured to provide said frame with a ledgeless and generally square discharge opening sized substantially equivalent to the standard opening defined toward the bottom of the railroad hopper car whereby allowing commodity discharged from the opening in the bottom of the railcar to pass through said gate assembly in a substantially unhindered fashion thereby promoting the discharge of commodity from the railcar, with said side frame members and said end frame members defining a bolting pattern generally corresponding to a standard bolting pattern surrounding the standard opening toward the bottom of the railroad hopper car whereby facilitating securement of the gate assembly to the railroad hopper car, with each side frame member and end frame member including a

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peripheral flange portion joined to and extending outward from an upper end of depending wall structure, and wherein said ledgeless frame further includes a generally centralized support extending generally parallel to the longitudinal axis of said frame with two additional supports disposed to opposed sides of said centralized support;

a gate slidably mounted on said frame for endwise movements between open and closed positions relative to said ledgeless opening defined by said frame and along a generally linear path of movement for controlling discharge of commodity through said ledgeless opening, with said gate being supported by said supports when in the closed position and supported by said frame when moved to the open position, and wherein the linear path of movement of said gate is disposed vertically beneath the flange portion on each side frame member and end frame member of said rigid frame;

seal structure arranged in sealing engagement with the upper surface and toward a periphery of said gate when said gate is in the closed position, with said seal structure being carried by said frame in vertically spaced relation below the flange on said side frame members and said end frame members and configured to promote movement of said commodity therepast when said gate is moved toward said open position;

an operating shaft assembly mounted on frame extensions of said side frame members for rotation about a fixed axis, said operating shaft assembly defining a pair of opposed ends disposed for operator access from opposite sides of said frame;

a drive mechanism for operably coupling said operating shaft assembly to the gate

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whereby rotation of said operating shaft assembly linearly moves said gate between the open and closed positions; and

a lock mounted on said frame extensions for movement between a first position, wherein said lock is disposed in the path of movement of said gate whereby inhibiting inadvertent movement of the gate from the closed position toward the open position, and a second position, wherein said lock permits movement of the gate toward the open position

57. (New) The gate assembly according to Claim 56 wherein each support on said frame is provided with material for enhancing the ability of the gate to slide thereover as said gate moves between the closed and open positions.

58. (New) The gate assembly according to Claim 56 wherein said drive mechanism includes a pair of laterally spaced pinions mounted on a shaft of said operating shaft assembly, with said pinions being arranged in intermeshing relation with racks carried by said gate.

59. (New) The gate assembly according to Claim 58 wherein said frame further includes structure for limiting deflection of said shaft of said shaft assembly relative to said fixed axis when said operating shaft assembly is rotated to move said gate from the closed to the open position.

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60. (New) The gate assembly according to Claim 56 wherein said operating shaft assembly includes an elongated shaft supported for rotation about said fixed axis by a pair of operating handles secured at opposite ends of said shaft and rotatably mounted on the frame of said gate assembly.

61. (New) The gate assembly according to Claim 56 wherein each side frame member and each end frame member further includes another peripheral flange portion joined to and extending outwardly from a lower end of said depending wall structure such that each end frame member and each side frame member is configured to maximize the section modulus of said frame, and wherein the flange portion extending outwardly from the upper end of said wall structure of each end frame member and each side frame member defines a series of apertures defining the bolting pattern for said gate assembly.

62. (New) The gate assembly according to Claim 61 wherein the flange portions extending outwardly from the lower end of the wall structure on the side frame and end frame members of said frame are arranged generally coplanar relative to each other.

63. (New) The gate assembly according to Claim 56 wherein a tamper seal arrangement is provided in combination with said operating shaft assembly for accepting a seal for visually indicating whether said gate has been moved toward the open position.

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IN THE ABSTRACT OF THE DISCLOSURE:

Please amend Paragraph [0095] as follows:

[0095] A discharge gate assembly adapted to be secured in material receiving relation relative to a standard opening toward a bottom of a railroad hopper car ~~is disclosed~~. The gate assembly of the present invention satisfies AAR requirements and specifications and includes a rigid frame defining a ledgeless and generally ~~rectangular~~ square discharge opening which is sized substantially equivalent to the standard opening defined toward the bottom of the railcar whereby allowing commodity discharged from the opening in the railroad hopper car to pass through the gate assembly with minimum interference or obstruction thereby promoting the discharge of commodity from the railroad car. A gate is slidably movable between open and closed positions relative to the discharge opening on the gate assembly and is suspended, in a closed position, by a series of supports extending therebeneath.

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REMARKS

Responding to a September 2, 2004 Office Action, and by the present response, the specification and Claims 1, 3, 10, 19 through 22, 26, and 32 are amended, Claims 2, 11, and 28 have been canceled, and new Claims 40 through 63 have been added. An additional Filing Fee is attached for the newly added claims. No new matter has been added by the present response. Reconsideration of this patent application is respectfully requested.

Applicant's attorney gratefully acknowledges the courtesies extended by Examiner M. Le during personal interviews on October 21, 2004 and November 18, 2004. During the October 21, 2004 personal interview with Examiner Le, proposed amendments to Claim 1 were discussed in view of the prior art references relied upon in the September 2, 2004 Office Action. At the conclusion of the interview, and as indicated on the 21 October 2004 *Interview Summary*, agreement was reached with Examiner Le regarding the patentability of amended Claim 1. During the November 18, 2004 personal interview with patent Examiner Le, the addition of new Claims 40 through 63 was discussed with Examiner Le.

The amendments to the specification place the disclosure in a preferred form. Notably, no new matter has been added by or through the amendments to the specification.

The present invention relates to a discharge gate assembly for a railroad car. The gate assembly includes a rigid frame having a discharge opening. Notably, the discharge opening of the gate assembly of the present invention is: 1) ledgeless; 2) generally square in cross-sectional configuration; and 3) greater than 1600 square inches. To control the discharge of commodity

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through the discharge opening, a gate slidably moves in a predetermined plane between closed and open positions and relative to the discharge opening. The gate has an upper surface area which is generally equivalent in size to the discharge opening.

The gate assembly frame is configured to inhibit bending thereof under columnar loading adapted to be applied to the greater than 1600 square inches of surface area defined by the upper surface of the gate exposed to commodity carried by the railcar on which the gate assembly is mounted. More specifically, the gate assembly frame includes an upper flange extending outwardly and about a periphery of the frame for facilitating connection of the gate assembly to a hopper of the railroad car. The gate assembly frame further includes wall structure rigidly connected to and depending from the upper flange. Notably, the predetermined plane of movement of the gate is disposed in vertically spaced relation below the upper flange on the frame of the gate assembly.

The gate assembly of the present invention further includes seal structure arranged in sealing engagement with an upper surface and toward a peripheral edge of the gate when the gate is in the closed position. The seal structure is carried by the gate assembly in vertically spaced relation below the upper flange. Moreover, the seal structure is configured to promote movement of the commodity discharged from the railcar to move therepast when the gate is moved toward the open position.

According to the present invention, the gate assembly furthermore includes an operating shaft assembly supported on the gate assembly frame for rotation about a fixed axis. The

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operating shaft assembly is operably coupled to the gate. Moreover, the gate assembly includes a lock assembly mounted on the gate assembly frame. The lock assembly includes a stop for inhibiting inadvertent movement of the gate from the closed position toward the open position.

As discussed with Examiner Le during the October 21, 2004 personal interview, corn is one commodity typically transported in railroad cars. Using a wet milling process, a kernel of corn can be separated into several products. Corn gluten is a by-product of the wet corn milling process. Corn gluten contains significant amounts of energy, crude protein, digestible fiber and minerals. As such, wet corn gluten is used by farmers as an excellent feed.

Wet corn gluten, however, requires special unloading procedures. Wet corn gluten feed has a sticky texture resembling oatmeal and has reduced flow characteristics, thus, exacerbating its discharge from a railroad hopper car. Moreover, the wetness of the material increases the columnar loading placed upon the gate assembly. Settling and compaction of this commodity during transport causes other significant problems during unloading of the product.

Once a hopper car reaches an unloading site, the gate assembly is opened and gravity normally causes the commodity within the walled enclosure or hopper on the car to readily flow therefrom. The reduced flow characteristics, however, of wet corn gluten feed, especially when combined with the tendency of such material to settle during transport, frequently causes bridging of the material across the discharge opening, thus, creating problems in unloading the railcar. Gate supporting ledges extending inwardly toward the discharge opening on the gate assembly only serve to promote formation of a bridge or material plug extending across the

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discharge opening so as to inhibit mass flow of material and, thus, exacerbate the problem of moving sticky materials through the discharge opening of the gate assembly.

U.S. Patent No. 5,829,359 to J. J. Dohr, *et al.* was the primary reference relied upon in the September 2, 2004 Office Action. The '359 Dohr, *et al.* device is one of many unique gate assembly products developed by Miner Enterprises, Inc. - the Assignee of the present invention. While offering advantageous features, the '359 Dohr, *et al.* device includes a gate assembly defining a discharge opening measuring about 30 inches by 30 inches or 900 square inches in cross-section.

In contrast, and as mentioned above, the gate assembly of the present invention defines a discharge opening which is **greater than** 1600 square inches. Structuring the gate assembly with a **square** discharge opening **greater than** 1600 square inches offers several benefits. That is, structuring the gate assembly with a **square** discharge opening **greater than** 1600 square inches allows for rapid discharge of materials from the railcar. As will be appreciated, rapid discharge of materials from the railroad car reduces the amount of time required for unloading of the car and reduces the time the car is essentially removed from service. Moreover, structuring the gate assembly with a **square** discharge opening **greater than** 1600 square inches inhibits: 1) creation of a solid plug spanning such a large distance; and, 2) the ability of any plug or bridge which can span such a distance to withstand the significant gravitational forces acting against such plug or bridge once support from the slidable gate is removed from the underside thereof.

Testing revealed the size of the discharge opening defined by the '359 Dohr, *et al.* device

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simply did not promote the mass flow of corn gluten therethrough. Moreover, and in contrast to the present invention, the side frame and end frame members of the '359 Dohr, *et al.* device converged toward the discharge opening of the gate assembly. Such convergence of the side frame and end frame members of the '359 Dohr, *et al.* device tends, especially during movement of the railcar, to compact the commodity or materials and, thus, tends to make the bridge or plug of material extending across the discharge opening of the gate assembly even thicker and stronger. As such, when the gate is moved toward the open position, such plug or bridge of material inhibits the mass flow of material through the discharge opening of the gate assembly.

Absent the teachings of the present invention, nothing within the four corners of the '359 Dohr, *et al.* patent hints at a problem involving discharge of material through the discharge opening of the gate assembly. Whereas, the '359 Dohr, *et al.* device is structured in a manner antithetical to the present invention. In this regard, attention is directed to Column 5, lines 65 through 67 and Column 6, line 1 which state:

Toward their lower ends, the sides 18, 20 and end walls 22, 24 each define a common support structure upon which a door or gate 30 is mounted for movement between open and closed positions.

Configuring the lower ends of the sides and end walls with support structure projecting into the discharge opening has two adverse effects. First, such gate assembly configuration further constricts the discharge opening. Second, such a design is contrary to the ledgeless design set forth in each and every one of the independent claims presented for review. Configuring the lower ends of the frame walls with gate supporting structure extending into the discharge opening

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also provides structure onto which certain commodities can cling and stick and, thus, promote -- rather than detract from -- the creation of a material plug or bridge across the discharge opening.

Simply stated, designing a railroad hopper car gate assembly with a **square** and **ledgeless** discharge opening having a cross-sectional configuration **greater than 1600 square inches** is simply neither disclosed nor factually suggested within the four corners of the '359 Dohr, *et al.* patent. The problems addressed and solved by the '359 Dohr, *et al.* invention are different from those addressed and solved by the present invention. Nothing within the four corners of the '359 Dohr, *et al.* reference hints at the problems addressed by the present invention. The '359 Dohr, *et al.* device simply does not and cannot offer solutions to the problems presented by the present invention. For these and other reasons, the independent claims presented for review by the present response are considered patentable over U.S. Patent No. 5,829, 359 to J. J. Dohr, *et al.*

Furthermore, U.S. Patent No. 3,348,501 to E. S. Stevens, *et al.* fails to fill the multiple voids separating the claims presented for review from the '359 Dohr, *et al.* device. As discussed with Examiner Le during the October 21, 2004 interview, and in contrast to the independent claims presented for review, the '501 Stevens, *et al.* gate assembly is configured with a long and narrow opening. Contrary to the **square** discharge opening of the present invention, and as specified at Column 1, lines 45 through 47 of the '501 reference, the Stevens, *et al.* gate assembly is designed to operate in combination with:

bottom discharge outlets of dimensions, such as twenty-seven (27) inches by sixty-three (63) inches.

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Within the four corners thereof, the '501 Stevens, *et al.* disclosure fails to recognize the serious and increasingly difficult problems involving the discharge of certain types or kinds of materials through a discharge opening of a railroad hopper car gate assembly. Testing has revealed, and as discussed with Examiner Le during the October 21, 2004 interview, a gate assembly designed with a discharge opening having only twenty-seven (27) inches between opposed sides thereof tends to allow certain material to form a solid plug or bridge across the discharge opening and, thus, exacerbate the already difficult railroad car unloading process. Moreover, to combine the teachings of the '501 Stevens, *et al.* disclosure with that set forth in the '359 Dohr, *et al.* disclosure would require total reconstruction of the railroad car hopper and the size of the railroad car openings between the two different devices in a manner neither disclosed nor factually suggested by either reference.

Simply stated, and unlike the **square** discharge opening design of the present invention, within the four corners thereof, the '501 Stevens, *et al.* disclosure did not recognize any need or desire to increase the size of the gate assembly discharge opening **both** lengthwise and widthwise. Only this Applicant had the ingenuity to foresee the benefits forthcoming from designing a gate assembly with a **square** discharge opening **greater than 1600 square inches**. Only this Applicant had the wit to restructure and reconfigure the frame of the gate assembly to withstand the increased loads placed on a gate assembly having a discharge opening **greater than 1600 square inches**. For his ingenuity and wit, this Applicant is entitled to be awarded a patent.

Besides those non-obvious structural differences mentioned above, and in contrast to the

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claim program presented for review, the '501 Stevens, *et al.* device is further structured in a manner antithetical to the present invention. As mentioned at Column 2, lines 53 through 55, the side frame members 28 of the '501 Stevens, *et al.* gate assembly provide support for the gate 36 device moving between open and closed positions. As mentioned above with regard to the '359 Dohr, *et al.* invention, and in contrast to the claim program presented for review, the '501 Stevens, *et al.* gate assembly IS NOT ledgeless.

Configuring the side members of the gate assembly frame to support the gate as taught by the '501 Stevens, *et al.* device has two adverse effects. First, such gate assembly configuration further constricts the discharge opening. Second, such a design is contrary to the ledgeless design set forth in each and every one of the independent claims presented for review. As will be appreciated, configuring the sides and/or ends of the gate assembly with structure for supporting the gate concurrently adds an obstruction onto which the certain commodities can cling and stick, thus, promoting creation of a material plug or bridge across the discharge opening.

Furthermore, the claim program defining the present invention further includes seal structure carried by the gate assembly frame beneath the upper flange and in engaging relationship toward a peripheral edge of the gate. Notably, the gate assembly seal structure is furthermore structured to promote the movement of commodity therepast. Configuring the seal structure such that the commodity passing through the discharge opening of the gate assembly tends to move therepast is an important design innovation which inhibits material from clinging or sticking to the seal structure thereby reducing the likelihood of material buildup.

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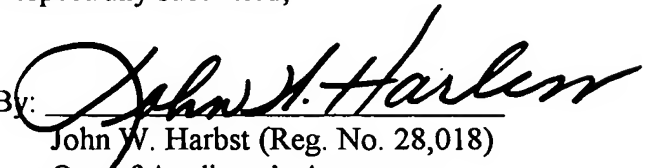
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As discussed with Examiner Le during the October 21, 2004 interview, the '501 Stevens, *et al.* disclosure is silent regarding providing seal structure in operable combination toward a peripheral edge of the gate. In fact, and within the four corners thereof, the '501 Stevens, *et al.* reference fails to disclose or factually suggest providing any form of seal structure in operable combination with the peripheral edge of the gate. As such, there can be no factual disclosure in the '501 Stevens, *et al.* reference of the particular configuration of such seal structure.

For these and other reasons, the claim program presented for review is considered patentable over U.S. Patent No. 5,829, 359 to J. J. Dohr, *et al.* taken alone or in purported combination with U.S. Patent No. 3,348,501 to E. S. Stevens, *et al.* As such, reconsideration of amended Claims 1, 3 through 10, 12 through 27, 29 through 39 as well as consideration of new Claims 40 through 63 is respectfully requested. Moreover, an early passing of this application to allowance is hereby courteously solicited. Should Examiner Le desire to speak with Applicant's attorneys, they may be reached at the number indicated below.

Respectfully submitted;

Date: November 18, 2004

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